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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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09/683,364

12/19/2001

Kuang-Yeh Chang

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09/22/2004

NAIPO (NORTH AMERICA INTERNATIONAL PATENT OFFICE)

P.O. BOX 506

MERRIFIELD, VA 22116

EXAMINER

WARREN, MATTHEW E

ART UNIT

PAPER NUMBER

2815

DATE MAILED: 09/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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|------------------------------|--------------------------------------|-------------------------------------|--|
| Office Action Summary | Application No. 09/683,364 | Applicant(s) CHANG ET AL. | |
| | Examiner Matthew E Warren | Art Unit 2815 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 July 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 20,21 and 23-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 20,21 and 23-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 July 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This Office Action is in response to the Amendment filed on July 16, 2004.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 20, 21, and 23-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's prior art figure (APAF) in view of Yamazaki et al. (US 6,677,613 B1).

In re claim 20, the APAF 1 and 7 shows a microdisplay pixel cell device, the device comprising a semiconductor substrate defined with a plurality of active areas at least one gate (52), the gate covering a portion of the active area, at least one source/drains (63/64), the source/drain being in the active area, and a first dielectric layer (66) the first dielectric layer covering the gate and the source/drain. The first dielectric layer comprises at least one row select contact plug (68) to electrically connect to the gate and at least one row select line, the row select line being atop the first dielectric layer, the row select line being electrically connected to the gate through the row select contact plug. There is at least one pixel cap top plate (42) on the first dielectric layer, at least one capacitor dielectric layer (45), the capacitor dielectric layer

being atop the surface of the top plate; and at least one pixel cap bottom plate (54). At least one first contact plug is comprised in the first dielectric layer for electrically connecting the source and the top plate (APAF 1, and pg. 2, para. [0007]). The APAF 7 shows all of the elements of the claims except the second dielectric layer being atop the first dielectric layer. Yamazaki et al. shows (figs. 1A-3) a pixel cell device comprising a first dielectric layer (125) formed over a gate (109), and a second dielectric layer (134) formed on the first dielectric layer. Yamazaki also shows a pixel cap bottom plate (139) being atop the second dielectric layer and covering a capacitor top plate (135) and a capacitor dielectric layer (135). With the capacitor being formed simultaneously with the light shielding layer, the area of the pixel electrode could be reduced and a sufficient capacitance could be provided (col. 9, lines 29-35). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the pixel device of the APAF by adding a second dielectric layer as taught by Yamazaki so that capacitor top plate can be simultaneously be formed with a light shielding layer to ultimately reduce a pixel area and form a sufficient capacitor.

In re claim 21, the APAF 7 shows that the gate comprises a gate oxide layer (44), a polysilicon layer or a metal silicide layer.

In re claim 23, the APAF 1 discloses (pg. 2, para. [0007]) that at least one second contact plug (145) is comprised in the first dielectric layer and the second dielectric layer for electrically connecting the drain to a video data line.

In re claim 24, the APAF 7 discloses (pg. 4, para. [0014]) that the row select line is composed of a metal and is used as a scan line of the microdisplay.

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In re claim 25, the APAF 7 discloses (pg. 4, para [0016]) that both the bottom plate and the top plate are composed of a metal.

In re claim 26, Yamazaki et al. discloses (col. 6, lines 43-52 and col. 9, lines 1-7) that both the bottom plate and the top plate are composed of titanium (Ti), titanium nitride (TiN), aluminum (Al), copper (Cu) or an alloy of above-mentioned materials.

In re claim 27, the APAF 7 discloses (pg. 2, para. [0007]) the pixel cell comprises two gates, two common drains, four sources, four top plates and one bottom plate stacking in sequence from bottom to top.

In re claim 28, the APAF 7 discloses (pg. 2, para. [0006]) that the microdisplay is a reflective liquid crystal on silicon (LCOS) display.

Response to Arguments

Applicant's arguments filed with respect to claims 20-28 have been fully considered but they are not persuasive. The applicant primarily asserts that the prior art references do not show all of the limitations of the claims, specifically that the references do not show at least one first contact plug being in the first and second dielectric layer for electrically connected the source and top plate. The applicant then goes on to state that Yamazaki discloses that the drain is connected to the top plate. Although, Yamazaki does teach that the drain is connected to the top plate, Yamazaki also teaches that the sources and drains are interchangeable since the diffusion regions of the substrate could be either sources or drains (col. 6, lines 12-23). Furthermore, it is

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well known in the art that sources and drains are structurally the same but only differ in how one of ordinary skill would assign their function. In essence a source could also function as a drain if one were to change the biasing or input of the structure. With that said, the fact that the drain of Yamazaki is connected to the capacitor top plate does not make the instant invention distinguishable over the cited art, because one of ordinary skill in the art knows that the drain could be assigned a source function and become a source region if biased properly.

Furthermore, as stated in the rejection above, the applicant's prior art (in pg. 2, para [0007]) states that the source is connected the capacitor top plate and the drain is connected to the video line. Since Yamazaki was primarily cited to cure the deficiencies of the APAF by disclosing a second dielectric layer over the first dielectric layer, then when Yamazaki is combined with the APAF, the source would still be connected to the capacitor top plate as it was in the original APAF. Therefore, the prior art shows all of the elements of the claims and this action is made final.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the

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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew E Warren whose telephone number is (571) 272-1737. The examiner can normally be reached on Mon-Thur and alternating Fri 9:00-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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September 17, 2004

Tom Thomas

TOM THOMAS
SUPERVISORY PATENT EXAMINER
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